

## **4.0 ROUTE SELECTION PROCESS**

ITC Midwest engaged in a multi-step route selection process for the Project, including consideration of regulatory requirements, information gathering, public outreach and input, and comparison of route segments and alignments. Considerable public and agency participation efforts were conducted in Jackson, Martin, and Faribault counties. ITC Midwest developed a GIS database that consisted of data layers gathered from independent on-site data gathering and federal, State, and local agencies, including county departments, that ITC Midwest representatives met with as part of the outreach program for the Project.

In addition, ITC Midwest conducted public open house meetings to introduce the Project to, and gather feedback from, residents, landowners, LGUs, and other potentially-affected parties on resources present in the area that may not have already been identified through GIS data and on-site route review that could assist in the development of alternative routes for the Project. ITC Midwest developed a route network by analyzing the GIS data, including data gathered during on-site review, considering stakeholder feedback acquired during the route development stages of the Project, and considering the factors listed in Minnesota Rule 7850.4100 and Minnesota Statutes Section 216E.03, subdivision 7.

These activities resulted in the identification of two routes and several connector segments between the two routes for this Route Permit Application. The specific activities performed for each step in the route selection process are provided below in greater detail.

### **4.1 SUMMARY OF ROUTE SELECTION PROCESS AND GUIDING FACTORS**

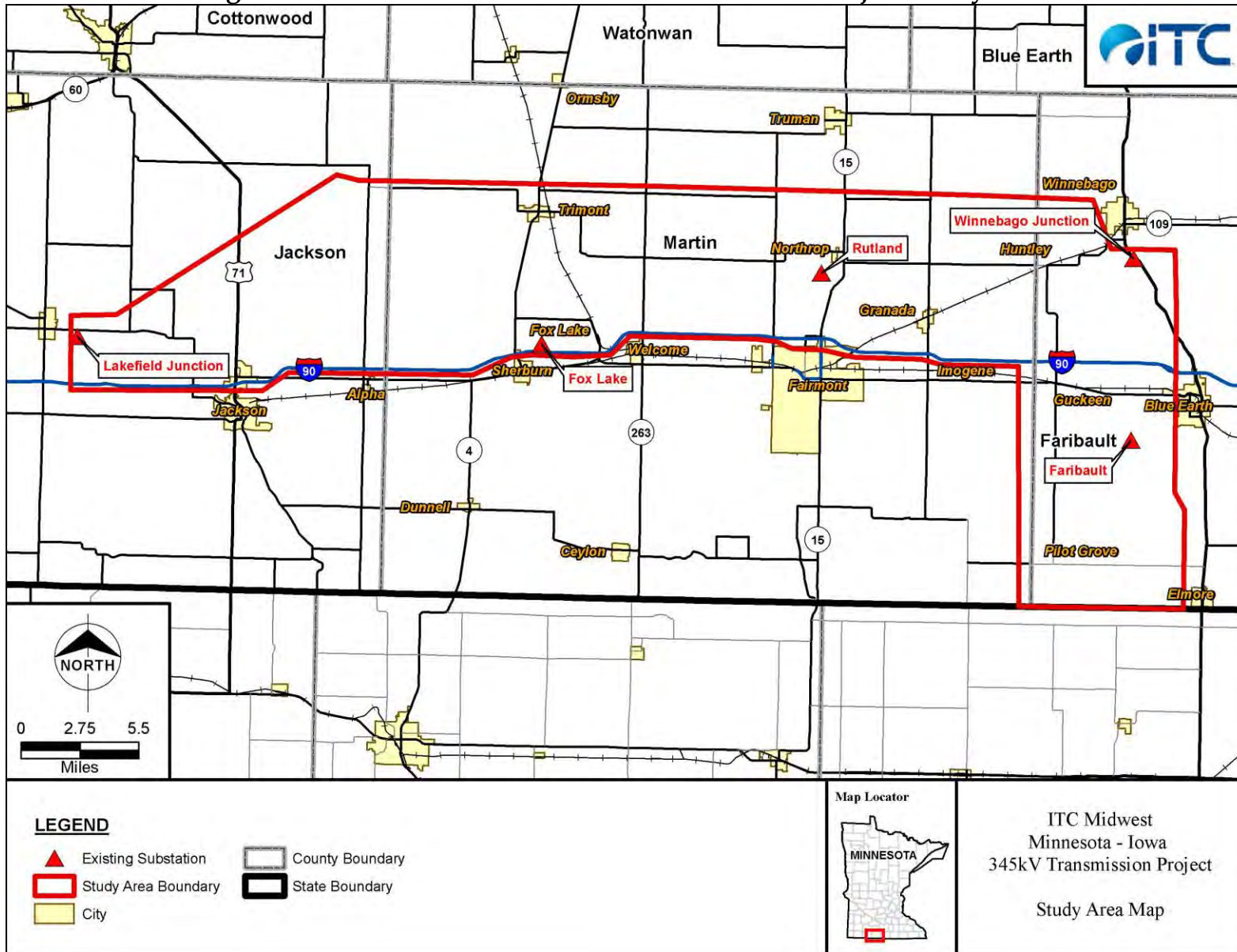
ITC Midwest initiated the route selection process by identifying the system connection points for the 345 kV transmission line (“termination points”). These termination points included the existing Lakefield Junction Substation just east of Lakefield in Jackson County, the proposed new Huntley Substation, to be located south of the existing Winnebago Junction Substation in Faribault County, and a necessary crossing into Iowa south of the Huntley Substation that would provide for the most efficient routing to connect the 345 kV transmission line in Minnesota to a new ITC Midwest Ledyard Substation near Ledyard, Iowa in Kossuth County. Although the Lakefield to Border 161 kV Transmission Line connects to the Fox Lake, Rutland, and Faribault substations, there is no system need for the Project to connect to these facilities, but the existing line must retain connections at these facilities.

Initially, MISO's MVP portfolio analysis of Project 3 in MTEP11 and ITC Midwest envisioned using the existing Winnebago Junction Substation for the Project, but constructability issues, additional space requirements associated with new Project facilities, and the need for major operational upgrades at the existing Winnebago Junction Substation due to the age of current equipment made development of the new 345 kV Huntley Substation desirable. A more detailed analysis of these issues that resulted in the development of the new Huntley Substation site is presented in **Section 2.4.2**. Should the facilities proposed for the Project be approved by the Commission, ITC Midwest plans to retire the existing Winnebago Junction Substation and reroute all existing lines entering and exiting the existing substation to the new Huntley Substation. Reconfiguration of four existing 161 kV transmission lines and three 69 kV transmission lines would primarily include the use of existing, but expanded, transmission line rights-of-way. Additionally, 69 kV transmission lines are proposed to be rebuilt to 161 kV standards but operated at 69 kV.

ITC Midwest acquired a site for the new Huntley Substation in December 2012. The site was selected because its use requires minimal rerouting of the facilities associated with the Project, provides sufficient space for all the necessary 345 kV/161 kV/69 kV equipment, and provides greater distance between the substation and the Blue Earth River. The site also presents few environmental constraints as it is a relatively level crop field outside any floodplains. ITC Midwest will allow agricultural activities to continue at the site until construction of the substation begins and may allow these activities to continue after construction of the Project is complete.

Following the identification of termination points, ITC Midwest developed a study area boundary that covers portions of Jackson, Martin, and Faribault counties. The study area covers an area of approximately 460 square miles and is approximately 52 miles long and seven miles wide, extending to approximately 19 miles wide in the portion of Faribault County that includes area for both the Lakefield Junction to Huntley segment of the Project and the portion from Huntley to the Iowa border ("Study Area"). The Study Area is shown in **Figure 9**.

Figure 9. Minnesota – Iowa 345 kV Transmission Project Study Area



After defining the Study Area, ITC Midwest initiated a series of mailings, meetings, and open houses to identify routes within the Study Area. Further details are provided in **Section 4.2** on the route development process.

The criteria set forth in Minnesota Statutes Section 216E.03, subdivision 7, and Minnesota Rule 7850.4100 guided the route development process. These criteria have been developed to guide the Commission's decision when selecting a route for a high voltage transmission line.

Minnesota Statutes Section 216E.03, subdivision 7(a) provides that the Commission's route permit determinations "must be guided by the state's goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state's electric energy security through efficient, cost-effective power supply and electric transmission infrastructure." Subdivision 7(e) of the same section requires the Commission to "make specific filings that it has considered locating a route for a high-voltage transmission line on an existing high-voltage transmission route and the use of parallel existing highway right-of-way and, to the extent those are not used for the route, the commission must state the reasons."

In addition to the statutory criteria mentioned above, Minnesota Statutes Section 216E.03 and Minnesota Rule 7850.4100 provide that when determining whether to issue a Route Permit for a high voltage transmission line, the Commission shall consider the following relevant factors:

- A. Effects on human settlement, including, but not limited to: displacement, noise, aesthetics, cultural values, recreation, and public services;
- B. Effects on public health and safety;
- C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;
- D. Effects on archaeological and historic resources;
- E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna;
- F. Effects on rare and unique natural resources;

- G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity;
- H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries;
- I. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way;
- J. Electrical system reliability;
- K. Costs of constructing, operating, and maintaining the facility which are dependent on design and route;
- L. Adverse human and natural environmental effects which cannot be avoided; and
- M. Irreversible and irretrievable commitments of resources.

## **4.2 PROCESS CHRONOLOGY AND DETAILS**

### **4.2.1 Project Study Area**

As discussed in **Section 4.1**, the initial step in the route selection process was the identification of termination points for the 345 kV transmission line. From these, the Study Area boundary was developed. The purpose of identifying a Study Area for the Project was to establish boundaries and limits for the information-gathering process (*i.e.*, identifying environmental and land use resources, routing constraints, and routing opportunities) and the subsequent development of routes for the Project. The Study Area needed to include the Project termination points: the Lakefield Junction Substation, the proposed Huntley Substation, and the Iowa border near Elmore, Minnesota.

The Study Area was designed to include an area large enough that a reasonable number of alternative routes could be identified without the Study Area being so large as to encumber the analysis with excessive data and routing options that did not present reasonable alternatives, provide opportunities to avoid routing constraint areas, and include areas of opportunity for routing of the Project. The Study Area also allowed ITC Midwest to focus its evaluation on a specific area associated with the proposed Project. ITC Midwest reviewed aerial photography available through the National Agriculture Imagery Program (“NAIP”) from the

spring of 2011 and conducted a general site survey in May 2012 to develop the Study Area for the Project.

#### **4.2.2 Initial Outreach for Study Area**

Following development of the Study Area, a letter and map was sent to federal, State, county, and local agencies and officials with jurisdiction within the Study Area. The letter requested feedback on potential resources and concerns to route development within the Study Area. A total of 25 agency letters were sent out on June 8, 2012 requesting feedback on routing information within the Study Area (**Appendix I**). A Study Area map (**Figure 9**) was provided with the letters.

ITC Midwest received written replies from four agencies and received an additional two requests for additional GIS data to assist the agencies in their review. The responses received by ITC Midwest are provided in **Appendix I**. More detail about these responses is available in **Section 9.1**. As a follow-up to the inquiry letters and to obtain additional information about potential routing concerns, ITC Midwest requested meetings with officials from Jackson, Martin, and Faribault counties. The meetings provided an opportunity to introduce the Project in greater detail and to obtain feedback from county representatives regarding potential resources and concerns unique to the area and to residents and landowners of each county. Additionally, the meetings provided an opportunity to discuss and obtain additional county-specific data that was available to incorporate into the existing GIS database developed for the Project.

Meetings with the Study Area counties (Jackson, Martin, and Faribault) were held on July 9, 2012. A range of staff members were present at each meeting, including county commissioners, planning and zoning staff, drainage administrators and inspectors, economic development staff, and county highway engineers. ITC Midwest provided an overview of the route selection process and provided details on the Project schedule and plans for open houses in each county. More details of the discussions with agency and county staff may be found in **Chapter 9** of this Application.

#### **4.2.3 Initial Route Identification**

After establishing a Study Area and completing initial outreach, the next step was to identify potential routes. The routing criteria used to develop potential routes primarily reflected those criteria in Minnesota Statutes Section 216E.03, subdivision 7, and Minnesota Rule 7850.4100.

As an initial screening criteria, ITC Midwest identified routing constraints (*e.g.*, airports, Wildlife Management Areas (“WMAs”), Waterfowl Production Areas (“WPAs”), residential subdivisions, lakes, etc.) that should be avoided, if practicable. ITC Midwest then identified opportunities (*e.g.*, existing transmission lines and rights-of-way, road rights-of-way, railroads, property division lines, field lines, etc.) for routes, where available. Practical considerations, such as total project length, constructability, impacts to large environmental areas, and costs were also considered. Based on these criteria, an initial series of route segments and connectors (“Route Network”) was developed. The Route Network took advantage of existing infrastructure and linear features (electrical transmission lines, roadways, drainage ways, property division lines, etc.) and undeveloped areas to the greatest extent practicable. Specific routing considerations sensitive to the Minnesota criteria (Minn. Stat. § 216E.03, subd. 7; Minn. R. 7850.4100) were identified in the Study Area. Further, these routing criteria were defined in more detail and the following were used to narrow down route options:

- Maximize distance from residences;
- Minimize multiple crossings of highways in short distances;
- Minimize repeated crossings of waterways;
- Minimize woodland clearing;
- Avoid terrain that makes construction and maintenance of a transmission line more difficult;
- Cross pasture, grassland, or rangeland rather than cropland;
- Attempt to cross cropland at narrow areas where it could be spanned or the number of structures in fields could be minimized;
- Maximize distance from radio towers, other communication-related facilities, and wind turbines; and
- Maximize distance from or identify opportunities to span known archaeological and historic resources sites.

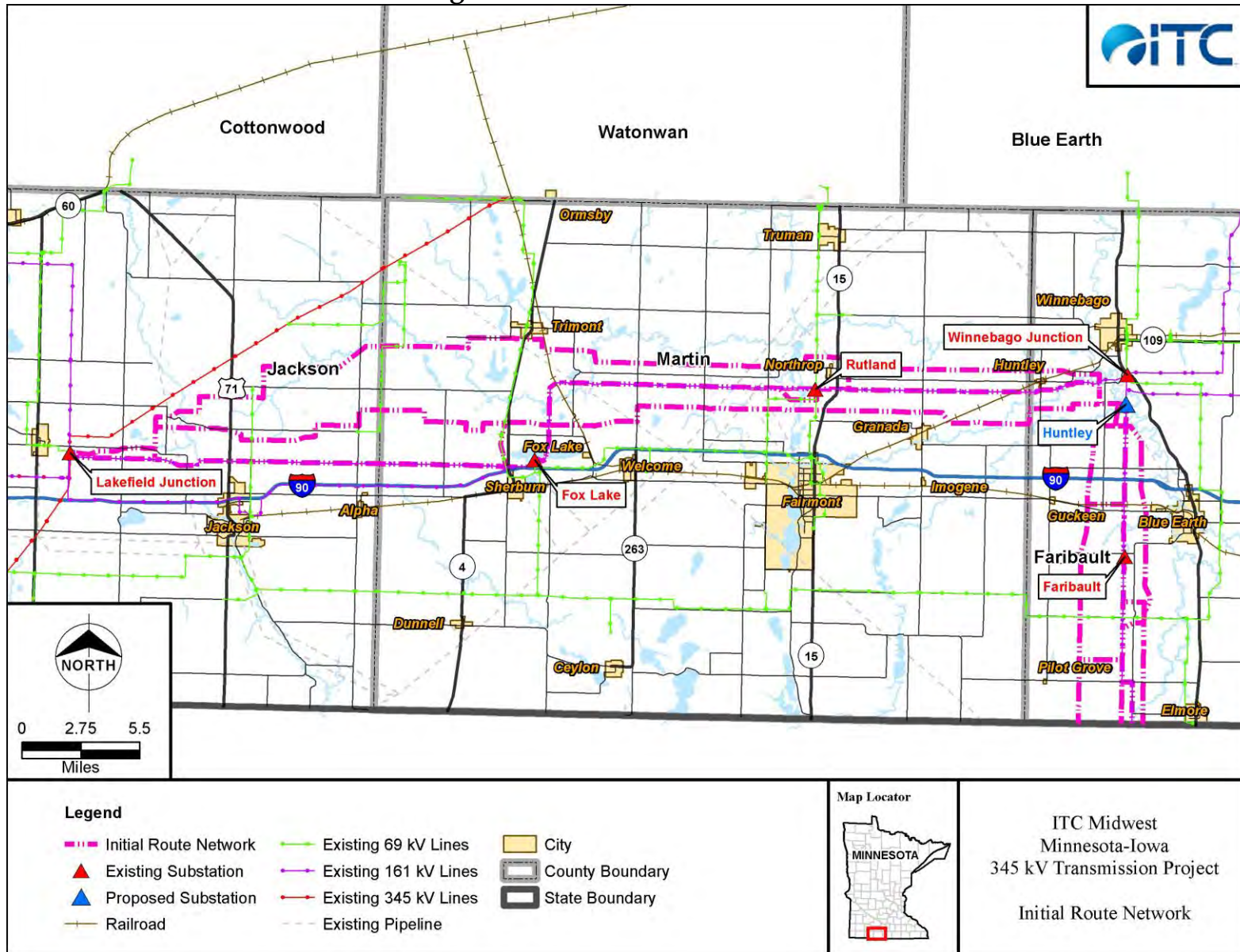
#### **4.2.4 Site Review of Route Network**

Following the county meetings, ITC Midwest staff performed additional site review of the Study Area, including a visual inspection of the existing Lakefield to Border 161 kV Transmission Line. Using data and information gathered from the formal agency responses, county meetings, site reconnaissance, and the GIS database developed for the Project, ITC Midwest staff investigated numerous route segments. These segments were reviewed in the context of Minnesota's routing criteria. The route segment network incorporated those that ITC Midwest believed complied with the Minnesota routing criteria and the additionally-developed considerations. Routes that could not avoid major routing constraints, did not take advantage of existing linear features, did not minimize impacts, or created engineering or construction challenges were dropped from further consideration, even if they were otherwise generally compliant with Minnesota's routing guidelines.

ITC Midwest developed an initial Route Network for the Study Area. The initial Route Network included approximately 40 route segments that, when combined, created approximately 80 route combinations (although some routes differed from each other by only one or two segments). In general, route segments are shorter portions of overall routes that, when joined together, create complete routes between the two connection points. Route segments result when a section of a route branches into other segments or results from multiple individual segments joining together. In joining specific segments, different segment combinations and subsequent routes linking the desired connection points, are created. Routes were reviewed for general constructability and engineering feasibility from a design and planning perspective and reviewed for general compliance with Minnesota Statutes and Rules. Minor adjustments to the Route Network were made based on these reviews. The initial Route Network is provided in **Figure 10**.



Figure 10. Initial Route Network



### 4.2.5 Public Open House Meetings

ITC Midwest staff conducted six public open houses during the week of September 10, 2012, two each in Jackson, Faribault, and Martin counties. ITC Midwest sent approximately 3,700 letters inviting residents, landowners, public officials, and other potential stakeholders to the meetings (**Appendix J**). ITC Midwest staff presented large-scale maps showing the initial Route Network developed for the Project. The open houses included nine separate information booths ranging in focus from routing, design and construction, regulatory, real estate/right-of-way, and environmental EMF.

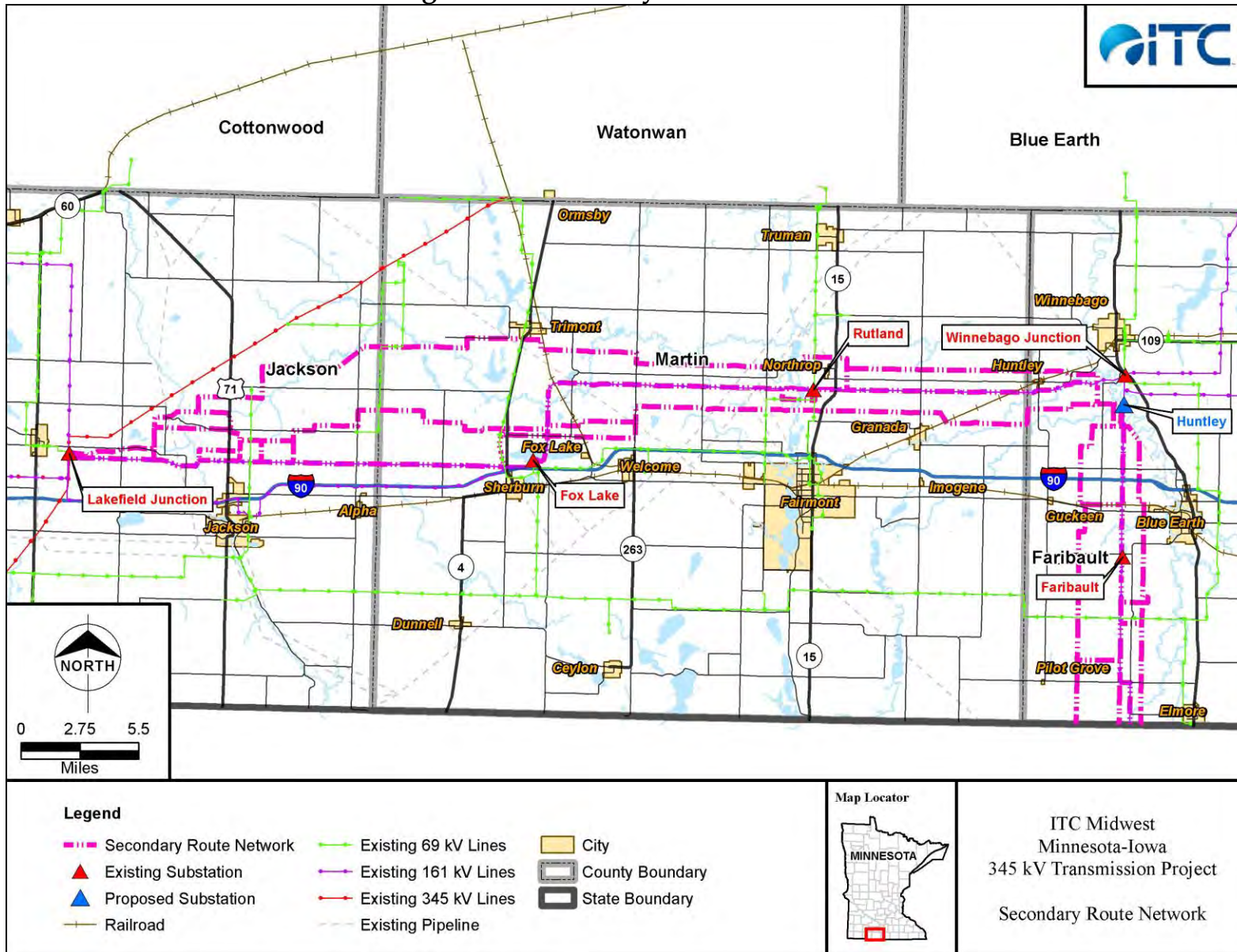
A total of 445 individuals attended the meetings. In addition to extensive verbal comments, ITC Midwest received a total of 114 formal written comments. Landowner feedback from these open houses included comments and concerns of proximity to municipal airports, agricultural infrastructure (e.g., center-pivot irrigation systems), wind farm development, land use and agricultural practices, preference to utilize field lines, and other route development considerations. Approximately 88 of the written comments received indicated a preference for ITC Midwest to choose the existing Lakefield to Border 161 kV Transmission Line for the proposed Project. Between the public open houses, ITC Midwest staff also met with representatives from Jackson Municipal Airport to discuss potential routing conflicts due to future airport expansion plans. More information on the feedback received is available in **Section 9.1.3**.

## 4.3 SECONDARY ROUTE NETWORK

ITC Midwest conducted a “windshield” survey of the entire Route Network the week of the open houses to expand the existing GIS database developed for the Project. This survey was planned to capture the location of potential routing considerations not previously identified during the GIS analysis of the Study Area and to review areas of concern noted by open house attendees. Locations of residences, out-buildings, radio and weather towers, wind turbines, transmission lines, and other features were recorded using GIS software and added to the GIS database developed for the Project.

Based on the comments received at the open houses and the windshield survey, the Route Network was revised to consider approximately 60 route segments, including additional connector segments developed in response to landowner requests or comments. The secondary Route Network is provided in **Figure 11**.

Figure 11. Secondary Route Network





As a result of the extensive number of alternative routes, a multi-step process was developed to assist in the identification of geographically diverse routes and to focus the analysis on the routes with the fewest impacts to natural resources and human settlement.

The entire Route Network was analyzed using a set of routing criteria selected to characterize the important features of each route and provide an indication of the potential concerns for environmental and human resources associated with each route consistent with Minnesota's routing criteria. The resulting routes were organized by the nature and extent of their potential impacts, allowing the routes that ITC Midwest determined were the least compliant with the overall Minnesota Statutory and Rule routing criteria to be removed from further consideration.

#### **4.4 DETAILED ROUTE NETWORK ANALYSIS**

##### **4.4.1 Development of Comparison Metrics**

The route screening process employed for this Project focused on identifying the best performing routes that minimized overall impacts to natural environments, land use, and were constructible and cost effective. The screening process was used to manage the large amount of data being reviewed for the route combinations and to distill the number of routes to a manageable number for further assessment. Several steps were undertaken in executing this screening process. These steps, discussed below, included development of evaluation factors, evaluation of screening data and analysis, and the additional consideration and comparison of the specific attributes of each alternative route investigated for the Project.

To compare the characteristics and potential impacts of route combinations, ITC Midwest developed a comprehensive set of route comparison and evaluation criteria. These criteria formed the basis of the screening analysis to identify a subset of routes upon which to form the remainder of the analysis. The criteria were based on routing factors set forth in Minnesota Statutes Section 216E.03, subdivision 7, and Minnesota Rule 7850.4100 and were categorized, generally, as human settlement, environmental, or engineering.

Route segments were assembled to develop complete routes between Lakefield Junction Substation and Huntley Substation and between Huntley Substation and the Iowa border. Route criteria data for each segment were tabulated to

provide an evaluation of the overall extent of the human and natural resources along each of the individual route combinations.

#### **4.4.2 Comparison of Segments and Routes**

Data for the route combinations were quantified for the route evaluation criteria for each of these segment combinations. Additionally, the routing criteria included evaluation categories such as length, area of new right-of-way, area of existing right-of-way, and numbers of occurrences of selected resources or features.

Although all criteria need to be considered during the routing process, design, and cost, certain criteria have the capacity to influence the Project in a greater manner than others. Therefore, there may be instances where the number of residences within a certain distance of a route could be reduced, but doing so would require substantially less use of existing transmission line and road rights-of-way. Also, a route may cross more acres of agricultural production lands but that route may cross those lands using an existing transmission line right-of-way.

The route screening analysis focused, primarily, on trends in natural resource and human settlement impacts of routes and the overall compliance of those routes with Minnesota routing criteria. Although a route may have had more anticipated human settlement impacts, it may have taken advantage of the greatest length of existing transmission line rights-of-way and had the fewest anticipated natural resource impacts. The route screening analysis was used to identify a smaller set of routes upon which to focus the selection process.

Generally, three alternative routes were identified for each segment of the Project. These included:

##### Lakefield Junction Substation to Huntley Substation

- The reconstruction of the existing Lakefield to Border 161 kV Transmission Line to double-circuit 345 kV/161 kV;
- A set of route options along new right-of-way extending across the more northerly portion of the Study Area, generally north of the existing Lakefield to Border 161 kV Transmission Line; and
- A set of route options along new right-of-way in closer proximity to the existing Lakefield to Border 161 kV Transmission Line.

### Huntley Substation to the Minnesota/Iowa Border

- The reconstruction of an existing Lakefield to Border 161 kV Transmission Line to double-circuit 345 kV/161 kV standards;
- A set of route options along new right-of-way generally in the westerly area of the Study Area, only slightly west of the existing Lakefield to Border 161 kV Transmission Line; and
- A set of route options along new right-of-way generally in the easterly area of the Study Area, only slightly east of the existing Lakefield to Border 161 kV Transmission Line.

These routes are shown in **Figure 11**. Additionally, opportunities were identified to connect between these routes to create hybrids to provide opportunities for avoidance of specific areas.

In comparing the routes, several land features were given additional routing consideration. These included crossing the Chain of Lakes area (*i.e.*, an assemblage of lakes near the center of Martin County, Minnesota), in particular, the existing 161 kV line crossing of Lake Charlotte; the Fox Lake area, including the game refuge lands and WMAs around the lake, residential development, and numerous existing transmission lines including the existing 161 kV line crossing of Fox Lake; and the existing Jackson Municipal Airport, including the proposed airport expansion. Several route segments were identified to address the issues and concerns associated with each of these areas.

Several trends were identified for each of the routes. These trends are summarized below:

### Lakefield Junction Substation to Huntley Substation

- Northern route options were generally longer than other route options considered. As a result, they had greater overall human and natural resources impacts. They crossed more cropland, had greater residential proximity, required more new right-of-way, and affected larger amounts of wetlands. ITC Midwest reviewed the northern routes and determined that these routes were the only routes that encountered areas of center-pivot irrigation systems, to which impacts could be minimized, but not completely avoided. The northern route options generally avoided potential conflicts with the Jackson Municipal Airport.

- Route options in close proximity to the Lakefield to Border 161 kV Transmission Line were generally the shortest of the route options identified. As a result, they crossed less cropland, had lower residential proximity, and would affect lesser amounts of wetlands and woodland. Additionally, because they were shorter, southern routes would require less new right-of-way than the longer, northern options. These options would require more new right-of-way than use of the existing 161 kV line alignment. The closer proximity routes included variations to provide routing options near Fox Lake, the Jackson Municipal Airport, and Lake Charlotte.
- Existing Lakefield to Border 161 kV Transmission Line options were similar in length to the closer proximity routes. They also had greater residential proximity and crossed more cropland but required much less new right-of-way and woodland clearing due to already established right-of-way. Additionally, they would consolidate transmission infrastructure to one right-of-way through the region instead of maintaining two separate high voltage transmission rights-of-way. Not specifically captured in the data is the fact that the existing line, constructed on two-pole H-frame structures, would be replaced, nearly in its entirety, with single pole steel structures, and would reduce existing agricultural impacts whereas the northern or southern alternatives would create new agricultural conflicts where transmission infrastructure did not previously exist. Residences near the existing line would see some changes in the view of the line due to larger, single pole double-circuit structures, but the change would be incremental over the infrastructure already in place. Existing line options included variations to address potential routing concerns near Fox Lake, Lake Charlotte, and the Jackson Municipal Airport.

#### Huntley Substation to the Minnesota/Iowa Border

- Eastern and western routes were generally longer than using the existing Lakefield to Border 161 kV Transmission Line.
- The existing Lakefield to Border 161 kV Transmission Line had greater residential proximity due to considerable length of the line being located along county roads. Routing options to avoid the Pilot Grove Lake WPA, crossed by the existing 161 kV line were considered.

- Options west of the existing 161 kV Lakefield to Border 161 kV Transmission Line between Huntley and the Iowa border had lower residential proximity. The western route options crossed greater amounts of cropland and passed through actively developing wind farm areas. Western route options avoided the Pilot Grove Lake WPA but did not contemplate removal of the existing 161 kV line through the WPA.
- Eastern route options had greater residential proximity associated with their closer proximity to the City of Blue Earth. Eastern route options were generally shorter than western route options. Eastern options crossed less cropland but more woodland, wetland, and grassland, likely due to closer proximity to the Blue Earth River and its associated riparian areas. Eastern route options avoided the Pilot Grove Lake WPA but did not contemplate removal of the existing 161 kV line through the WPA.

Having identified these trends in the route families for each segment of the Project (Lakefield Junction to Huntley and Huntley to the Iowa border), routes were reviewed in detail. This review considered potential human settlement and natural resource impacts as well as compliance with Minnesota routing criteria, regulatory requirements of other agencies for project permitting (Minnesota Department of Natural Resources (“MnDNR”) regulations for lake crossings, for example), and engineering and construction considerations (access, constructability, etc.). Based on this analysis, two routes that extended from the Lakefield Junction Substation to the Huntley Substation and on to the Iowa border, along with some variations and connector segments to address potential site specific concerns, were identified. These routes are discussed in the **Section 4.4.4**, and **Chapter 5**.

#### **4.4.3 Elimination of Certain Routes**

Upon thorough and detailed investigation, evaluation, and consideration, routes were dropped from further consideration for this Project. The routes and reasons for elimination are discussed below:

##### Lakefield Junction Substation to Huntley Substation

- Routes north of the existing Lakefield to Border 161 kV Transmission Line. These routes were generally longer than the other routes considered, had greater overall human and natural resources impacts, and encountered areas of center-pivot irrigation to which impacts could only be minimized but not avoided.



- Lake Charlotte. The existing 161 kV transmission line crossing of Lake Charlotte was constructed in the 1950s to connect the Fox Lake and Rutland substations. The Rutland Substation is owned by southern Minnesota Municipal Power Agency (“SMMPA”). When the line was constructed, the MnDNR issued a license to allow a 161 kV transmission line crossing of the lake. That license required that the transmission line maintain a 25-foot minimum clearance between the lowest point of the conductor and the ordinary high water level. In 2010, ITC Midwest determined that this minimum clearance was not present at the Lake Charlotte crossing. ITC Midwest worked with the MnDNR to address this clearance concern. ITC Midwest and the MnDNR determined that the crossing at Lake Charlotte needed to be rebuilt by the end of 2012. At that time, the MnDNR indicated that it would not likely issue a license for an additional circuit across Lake Charlotte. Additionally, the Rutland Substation configuration limits how the Lakefield to Border 161 kV Transmission Line can interconnect from Fox Lake. The Project has no operational or system need to connect to the Rutland Substation, but the Lakefield to Border 161 kV Transmission Line must connect to this facility. Several years ago, SMMPA rebuilt its Rutland Substation, requiring the 161 kV transmission line between the Fox Lake and Rutland substations to terminate on the west side of the substation. If the 161 kV transmission line were removed from the Lake Charlotte crossing, it would need to be configured to enter the Rutland Substation from the west. Because of this, ITC Midwest determined that the 161 kV transmission line crossing of Lake Charlotte should not be removed as part of the Project. Various segments around Lake Charlotte were initially developed and considered. Ultimately, a route was developed that avoided crossing the lake, lakeside residential development, and conflicts with existing transmission infrastructure.
- Fox Lake. Like the 161 kV crossing of Lake Charlotte, ITC Midwest worked with the MnDNR in 2010 to address a clearance concern identified at the crossing by the end of 2012. The 161 kV transmission line at Fox Lake was analyzed from planning, construction, and operations perspectives. ITC Midwest determined that this crossing must remain to provide connections for the Fox Lake Substation near the Alliant generation station in this area. ITC Midwest determined the MnDNR was unlikely to license another circuit crossing of Fox Lake. Further, the 345 kV transmission line is not proposed to connect at the Fox Lake Substation. Use of the existing 161 kV line right-of-way across Fox Lake was, therefore, eliminated from

consideration and ITC Midwest began looking for another route around Fox Lake. As other variations that would avoid a lake crossing were available, there was no system need to connect the 345 kV line at the Fox Lake Substation, and the lake crossing posed considerable environmental, engineering, and cost concerns, it was dropped from further consideration.

- Jackson Municipal Airport. Numerous segments were developed and investigated to address potential concerns for Project construction conflicting with the Jackson Municipal Airport proposed airport expansion. Reconstruction of the existing 161 kV line to a much taller, single pole 345 kV/161 kV double-circuit structures presents potential navigation hazards for existing airport operation and would be even more likely to be a hazard to operation of the airport according to the proposed expansion plans. Ultimately, routes around the airport were identified that ITC Midwest believes avoid presenting a navigational hazard for current and future airport operations, follow Minnesota routing guidelines, and minimize overall environmental impacts.

#### Huntley Substation to the Minnesota/Iowa Border

- Routes west of the existing Lakefield to Border 161 kV Transmission Line. Western routes were generally longer than other route options along this segment and were dropped from further consideration.

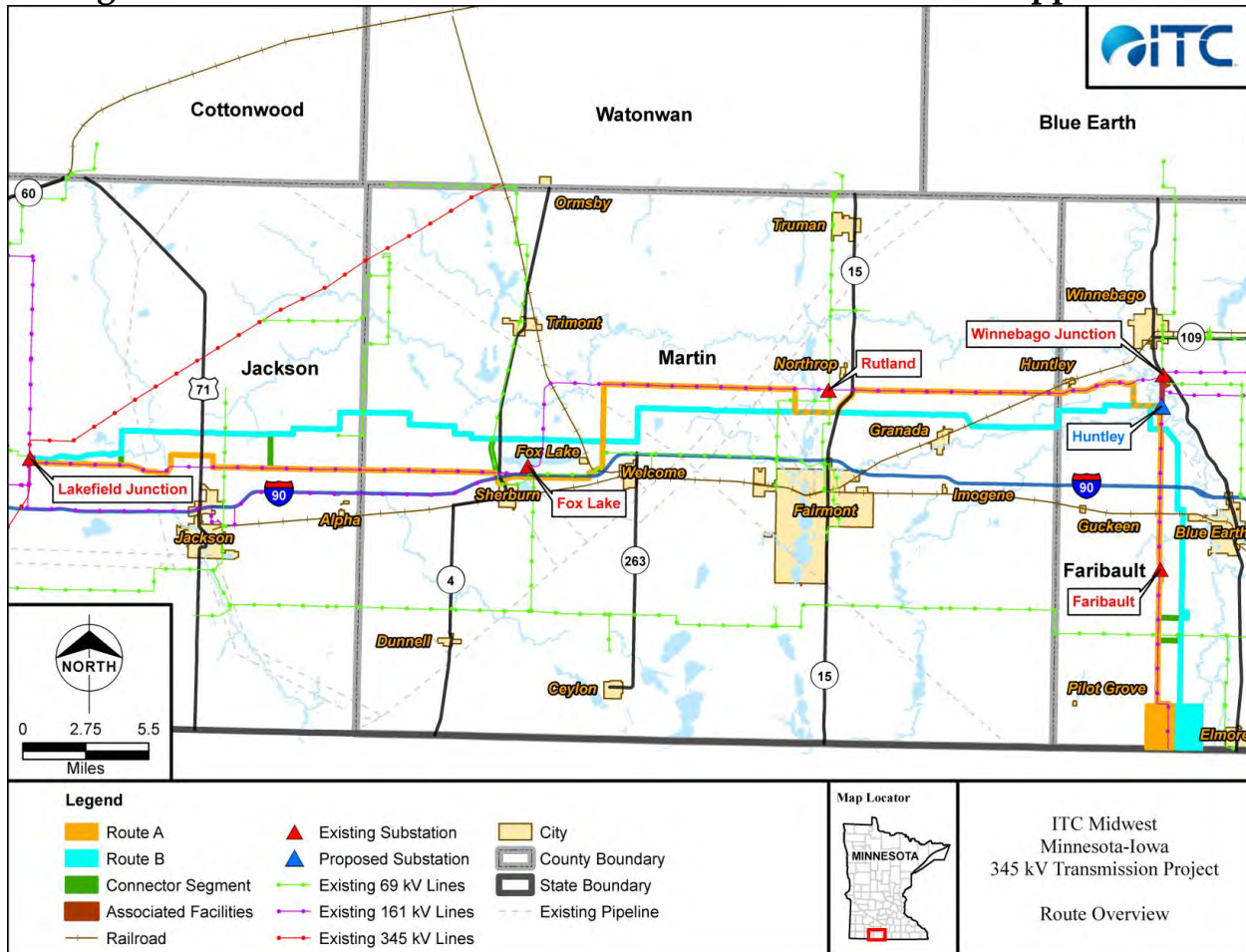
#### **4.4.4 Finalization of Proposed Routes**

The remaining routes were analyzed according to Minnesota routing criteria. Additional consultation feedback was received from agencies regarding the routes and that feedback was incorporated into the final two routes proposed for the Project. Information on the consultation feedback is available in **Section 9.1**.

During a meeting in the fall of 2012, the MnDNR informed ITC Midwest of concerns associated with constructing a 345 kV transmission line west of the Fox Lake Game Refuge. ITC Midwest contemplated a route in this area and included it in maps available at public open houses in September 2012. The area was identified by MnDNR as a significant migratory bird staging location. ITC Midwest developed a route that crosses south of Interstate 90 at Fox Lake and continues east for approximately 3.9 miles before crossing to the north of Interstate 90 and rejoining the existing Lakefield to Border 161 kV Transmission Line.

Applying the State routing criteria to the retained routes, ITC Midwest identified Route A and Route B, along with several connector segments included in this Application. These routes are shown in **Figure 12**.

**Figure 12. Final Routes Selected to Include in Route Permit Application**



#### 4.5 RATIONALE FOR SELECTING ROUTE A AS PREFERRED

Selecting Route A as the “Preferred Route” was primarily due to its co-location, for 75 percent of its entire length, with the existing ITC Midwest Lakefield to Border 161 kV Transmission Line. Certain modifications to Route A were made to account for development and land use changes that occurred around the existing Lakefield to Border 161 kV Transmission Line. A summary of the impacts and factors considered in evaluating the two routes and identifying Route A as ITC Midwest’s “Preferred Route” is available in **Table 10**.



Table 10. Summary of Impacts and Factors Considered (Minn. Stat. § 216E.03, subd. 7 and Minn. R. 7850.4100)

Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
<b>Effects on Human Settlement</b>			
Displacement	No displacement is anticipated for the Project.		
Noise	Temporary localized increases in noise during construction are anticipated. Transmission line and substation noise levels are not anticipated to exceed noise limits set by the MPCA.		
Aesthetics	Project would primarily replace existing line. New structures would be taller than existing structures but would not be inconsistent with existing viewscape and would eliminate most two-pole structures.	Route B would introduce a new visual feature. New line would not be inconsistent with existing viewscape in the Study Area given the presence of electric infrastructure, including transmission lines and wind generating facilities.	The landscape of the Study Area includes a variety of manmade features, including electricity lines, substations, wind turbines, and radio towers. Route A would have a lesser aesthetic impact as much of the construction would involve rebuilding an existing transmission line.
Cultural Values	No impacts to cultural values are anticipated.		
Recreation	Route A crosses snowmobile trails in five locations and two State Water Trails. Route A crosses no WMAs. Route A crosses the Fox Lake Game Refuge and Pilot Grove Lake WPA. Most of these recreational area crossings are at existing infrastructure crossings.	Route B crosses snowmobile trails in five locations. It also crosses a State Water Trail. Route B crosses the Fox Lake Game Refuge, and three WMAs. All crossings of recreational areas would be new.	Both routes would result in potential temporary noise, disruption, and use restrictions of recreational areas during construction. Route A would have fewer impacts due to the use of a substantial portion of existing utility rights-of-way.
Public Services	No impacts to public services are anticipated		



Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
Effects on Public Health and Safety			
Public Health and Safety	Effects on public health and safety for both Route A and B would include only minor temporary increase in demand for services during construction from the presence of construction crews. Applicant will comply with all applicable safety requirements during construction and operation of the proposed project.		
Effects on Land-Based Economies			
Agriculture	Approximately 1,545 acres of cropland within the anticipated right-of-way. Much of this cropland is within areas along the existing 161 kV line.	Approximately 1,465 acres of cropland impacts within the right-of-way.	Route B would result in more new acres of cropland within the right-of-way. Permanent impacts anticipated for associated facilities are the same for both routes.
Forestry	No impacts to economically important forestry will occur.		
Tourism	No impacts to tourism are anticipated.		
Mining	No impacts to active mining operations are anticipated. Active mining operations are located east of the Huntley Substation and outside any route proposed in this Application		
Effects on Archaeological and Historic Resources			
Archaeological Resources	There are 56 archaeological sites within one mile of Route A. There are 10 archaeological sites, including one NRHP Archaeological District, and four NRHP sites within the Route.	There are 53 archaeological sites within one mile of Route B and six archaeological sites within the Route. Two are NRHP eligible.	A greater number of archaeological resources have been identified along Route A. Five of the sites crossed by Route A, however, are crossed by the existing Lakefield to Border 161 kV Transmission Line

Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
Historic Resources	There are 31 historic architectural sites within one mile of Route A and three within the Route. None are NRHP eligible. One cemetery is within the Route, but not within the application alignment.	There are 25 historic architectural sites within one mile of Route B. Three historic architectural sites are within the Route. Two are NRHP-listed sites and the third has not been NRHP evaluated. No cemeteries are within the Route.	Known historic resources are more prevalent along Route A. Most of these resources are along the existing 161 kV line.
<b>Effects on the Natural Environment</b>			
Air Quality	During construction, vehicle emissions and fugitive dust along right-of-way and local gravel roads are expected to occur. Construction-related emissions would be similar but much less than those resulting from normal agricultural activities. Any emissions of ozone from the transmission line are expected to be well below federal and State standards.		



Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
Water Quality and Wetlands	Approximately 19 acres of wetlands, including four acres of forested wetlands are crossed by the Route A right-of-way. The right-of-way crosses a total of 44 acres of floodplains. The application alignment crosses 37 streams or rivers, including 17 PWI streams. One structure is likely to be placed in a wetland (replacing the H-Frame structure currently in the wetland), resulting in less than 0.01 acre of permanent impact.	Approximately eight acres of wetlands, including two acres of forested wetlands are crossed by the Route B right-of-way. The right-of-way of Route B crosses a total of 6.5 acres of floodplain. The application alignment crosses 32 streams or rivers, including 17 PWI streams. No structures are anticipated to be placed in wetlands.	Route B has fewer overall wetland impacts and crosses fewer streams but has more new impacts. Approximately 14 acres of the 19 acres wetlands crossed by the Route A right-of-way are crossed by the existing Lakefield to Border 161 kV Transmission Line.
Flora	The right-of-way would cross the Pilot Grove Lake WPA at the Lakefield to Border 161 kV Transmission Line. The crossing of the Fox Lake Game Refuge would primarily be near the MnDOT right-of-way or along an existing 69 kV transmission line. No WMAs, SNAs, or WRP easements are crossed.	Route B crosses three WMAs, and the Fox Lake Game Refuge. If Route B were selected, the existing Lakefield to Border 161 kV Transmission Line would remain across the Pilot Grove Lake WPA. No SNAs or WRP easements are crossed.	Route A crosses fewer habitats with native or restored flora currently unaffected by existing transmission line rights-of-way.



Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
Fauna	Clearing of the Route A right-of-way would result in the permanent loss of 13.1 acres of woodland habitat. Temporary disturbance to 1,545 acres of cropland and 191 acres of grassland during construction. No Important Bird Use Areas are crossed by Route A but one Grassland Bird Conservation Area (Fox Lake Game Refuge) is crossed.	Clearing of the Route B right-of-way would result in the permanent loss of 12.1 acres of woodland habitat. Temporary disturbance to 1,465 acres of cropland and 286 acres of grassland during construction. No Important Bird Use Areas are crossed by Route B but three Grassland Bird Conservation Areas (Toe and Bootleg Lake WMAs and the Fox Lake Game Refuge) are crossed.	Woodland habitat would be cleared and converted to non-woody habitat. Construction activity and noise would temporarily displace wildlife from the construction zone. Following completion of construction and restoration, wildlife would generally move back into the area.
<b>Effects on Rare and Unique Natural Resources</b>			
Rare and Unique Natural Resources	No reported federally- or State-listed threatened or endangered species within the Route. Six MCBS sites are crossed	Seven State-listed threatened or endangered species have been reported within the Route. Fifteen MCBS sites are crossed.	Route A has fewer recorded threatened and endangered species than Route B. Neither route has any recorded occurrences of federally-listed species.
<b>Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and Could Accommodate Expansion of Transmission or Generating Capacity</b>			
General	The design of the facilities along Route A and Route B will maximize energy efficiencies and mitigate adverse environmental effects.		



Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
Route Specific	Route A would be double-circuited with an existing 161 kV line or 69 kV line for 75 percent of its length and where not co-located, structures will be constructed to be 345 kV/161 kV capable.	Route B would be designed to accommodate a future 161 kV circuit.	Both lines would be designed to accommodate a second circuit, but both circuits would be installed along Route A in most places as part of the Project.
Use or Paralleling of Existing Division Lines			
Survey Lines, Natural Division Lines, Agricultural Field Boundaries	Approximately 71 percent of Route A follows agricultural field, survey, and natural division lines and boundaries.	Approximately 73 percent of Route B follows agricultural field, survey, and natural division lines and boundaries.	The use of survey lines, natural division lines, and agricultural field boundaries is greater for Route B.
Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way			
Existing Transportation Rights-of-Way	Approximately 12 miles of existing road right-of-way would be followed by Route A.	Approximately 35 miles of existing road right-of-way would be followed by Route B.	Route B follows considerably more existing road rights-of-way.
Existing Electrical Transmission Systems or Rights-of-Way	Approximately 55 miles, 75 percent, of Route A follows existing transmission rights-of-way.	Route B would use less than one mile of existing transmission line right-of-way.	Route A follows considerably more existing transmission rights-of-way.
Existing Pipeline Systems or Rights-of-Way	Neither route follows existing pipeline systems or rights-of-way, although there are crossings of pipeline systems and their rights-of-way.		
Electrical System Reliability			
Electrical System Reliability	Either Route A or Route B is needed to support and enhance the reliability of the regional electrical system.		

Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
Cost of Constructing, Operating, and Maintaining the Facility			
Construction Costs	Route A is approximately 73 miles long and has an estimated cost of \$206 million. This cost includes removal of the existing Lakefield to Border 161 kV Transmission Line, where applicable.	Route B is approximately 73 miles long and has an estimated cost of \$194 million. At least \$28 million would be required to install a 161 kV circuit on the open position in the future.	Initial construction costs for Route A would be greater than Route B. The cost for Route B does not include installation of the 161 kV arms on the 345 kV/161 kV double-circuit capable structures at this time.
Operation and Maintenance Costs	The minimal difference in overall project length (less than one mile) would not result in any differences in the operational costs of Route A and Route B. Costs for operation and maintenance of the expanded Lakefield Junction and new Huntley substations would be the same under either route.		
Adverse Human and Natural Environmental Effects Which Cannot Be Avoided			
General	Overall, unavoidable adverse impacts primarily include physical impacts to agricultural land due to construction of the Project. ITC Midwest will implement appropriate mitigation measures during construction to minimize impacts and will compensate landowners for damage to agricultural lands.		
Route Specific	Route A would potentially disturb up to 1,545 acres of cropland and 191 acres of grassland within the right-of-way. Permanent impacts to these lands would be limited to pole locations.	Route B would potentially disturb up to 1,465 acres of cropland and 286 acres of grassland within the right-of-way. Permanent impacts to these lands would be limited to pole locations.	Permanent impacts for the routes are anticipated to be comparable.

Factor	Route A and Associated Facilities	Route B and Associated Facilities	Summary
<b>Irreversible and Irretrievable Commitments of Resources</b>			
General	A commitment of people and resources would be required to successfully construct Route A. Some resources could be scrapped and recycled at the end of the life of the project, such as concrete and rock for foundations and aggregate backfill, steel poles, conductor and shield wires. Other resources would be irreversibly committed to the project and would be irretrievable. These would include trees cleared along the right-of-way, and fuels and lubricants used by equipment during construction. Resources committed would be similar for either route due to less than one mile difference in length, and the same general area being crossed by each route.		
Route Specific	Route A is approximately 73.0 miles long and would require approximately 436 structures.	Route B is approximately 73.4 miles long and would require approximately 434 structures. Although longer in length than Route A, Route B would require fewer angle structures.	Route A would, primarily, replace H-Frame structures with single-pole structures. Resource commitments for the two routes are anticipated to be comparable.

This Page Intentionally Left Blank